gases flowing immediately below it, thus decreasing the thickness
of the stream and increasing the thickness of the eddy of cooler
gases below it.

It is to be regretted that the bureau did not make surge
observations in this boiler setting as they would have been particularly interesting. This particular setting is an extremely good example of what should not be done. In his book, *Fours a Flamme,*
Professor Groume-Grjimailo makes the following comment upon
boiler settings: " The builders of boilers very rarely pay any

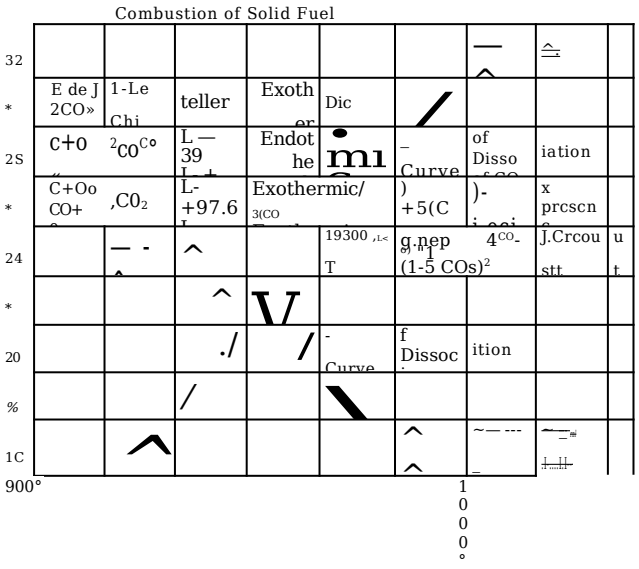

FIG. 180. — Equilibrium Curves of CO and $C0_2$ in the Presence of Nitrogen.
In the combustion of solid fuel the reaction occurs with a rising tempera-
ture CO-2Tl-C = 2CO when the temperature drops, particularly in the
presence of iron oxide the reaction reverses,

attention whatsoever to the rational distribution of the hot gases.
These defects are extremely

common in the most recent designs of water tube boilers; this is the explanation of the numerous systems of bafflings and obstructions of the gas passages which are intended to distribute the hot gases in such a manner that they will bathe regularly and uniformly the tubes of the boiler. In reality it is not necessary to have any baffling or distributing walls. The hot gases will rise of their own accord and the heat will be regularly and uniformly distributed to all parts of the boiler.[77]

The setting designed by A. Bement is shown in Bureau of Mines